

Possibility of Contraction of Universe

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Abstract: There is a statement that our Universe must expand always. The reasons of its possible contraction have been presented.

Once the expansion of our Universe has already retarded passing from the state $v > c$ to the state $v < c$ after 10^{-41} s after the Big Bang [1]. So now the expanding of the Universe moderated at a certain moment too, or even our Universe can begin to contract.

Surely we cannot reject the second Lemaitre solution.

We have the Hubble law:

$$v = Hs$$

and

$$\frac{dv}{dt} = H \frac{ds}{dt} = Hv$$

so:

$$v = v_0 e^{Ht}$$

If it can be $H < 0$ we have at once an explanation of the problem of the contraction of the Universe.

We assume that $H > 0$ and H is constant. But t may be smaller than zero ($t < 0$) because:

- we can have an oscillating Duff's time [2]
- Special Relativity implicates that:

$$t' = \frac{t - \frac{vx}{c^2}}{\sqrt{1 - \frac{v^2}{c^2}}}$$

The square root can be positive or negative.

Naturally, according to the second principle of thermodynamics this contraction must be conjugated with an interaction with another universe.

References:

[1] Z. Morawski, this website

[2] M. J. Duff, one of His works concerning oscillating universe